# GYPSY MOTH

Appearance and Spread of Insect in United States.

# MTRODUCED HERE IN 1869

pillars From France for Experi--Chief Control Measures Are Given.

By W. E. BRITTON, Connecticut Sta According to the best obtainable information, the gypsy moth was first ught into this country in 1869, or thereabouts, by Mr. L. Trouvelot, an artist and astronomer who was interested in silk culture. In order to overme a wilt disease or "flacherie" then playing havor in silk worm es- pillars. There are several predicteous tablishments, he tried to cross the slik insects, including the large ground bee-worm with certain other species to obtain a hardier or more resistant race stroy limited numbers. A few native of silk worms. Among other silk spin-ning caterpillars in their various parasites, but all of these agencies tostages which he imported from France for this purpose were some egg-masses of the gypsy moth. Some of the caterpillars escaped accidentally from the preeding enges at his home, Medford, Mass, and though he searched for them
Mass, and though he searched for them
and published a notice at the time, the
phanta, a Tachinid fly Compsilura
Gibson Consolidated Copper Company, and published a notice at the time, the affair was soon forgotten. The insect was not seen for years, but by 1889 had become a serious pest in this same

Methods of Spread. Gypsy moths are spread as follows: Egg-clusters are transported in many ways; caterpillars carried on vehicles; newly hatched caterpillars are blown in a strong wind. The former method accounts for most of the isolated colonies, and the latter may explain the increase in the area of long-standing in-

Egg-clusters laid in summer hatch the following spring, and the caterptilars become fully grown about the first of July. They then go into protected places and transform to the pupa stage. From ten to fourteen days is-

ter the adults emerge.

The female is a large-bodied whitish moth, with wing-spread of more than two inches; she cannot fly but lays on tree, fence, wall or building, masses containing 400 or more globular eggs. The male is smaller and darker in color and flies about. The mature caterillars are between two and three inches long, dark gray or brown, and hairy. A narrow light stripe extends along the back with a row of tubercles on each side. Each tubercle bears light brown hair. From the head backward the first five pairs of tubercles are blue and the remaining six pairs brick-red. The chrysalis is a naked 25 per cent. \$12.00@12.50; 10 per brown pupa fastened loosely by a few strands of silk.

Natural Enemies

Native birds such as cuckoos, oriole, robin, vireos, etc., feed upon the caterparasites, but all of these agencies together do not keep the pest in check. that can be found throughout its range have been brought from the Old was fifty cents and seventy-five cents World to New England. Of these, a extra. climate and multiplied, and have been per in another section of the mine. liberated in the infested territory, including Connecticut.

Control Measures.

foliage with lead arsenate, applying month, tanglefoot bands to the trunks of trees From resistant growth.

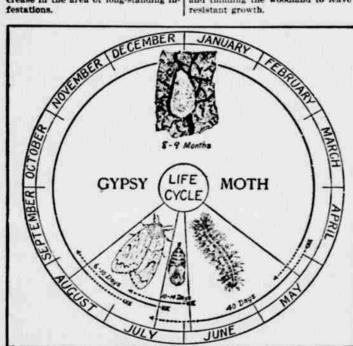


DIAGRAM SHOWING LIFE HISTORY OF GYPSY MOTH.

CHANGES NEEDED IN

tions in Most Parts Given by

Professor Merrill.

Fruit growers who wish the best re

and the materials used, according to F. S. Merrill, assistant professor of horti-

culture in the Kansas State Agricul-

A spraying schedule that should meet the conditions in most parts is

1. The cluster cup spray, to be ap plied when the blossom buds are just

2. The petal fall spray should be ap-

4. The fourth spray should be ap

given by Professor Merrill.

ural college.

scab and curculio

### CROWN GALL FOUND IN NURSERY STOCK

ble to Disease Than Older Ones-Control Difficult.

(By J. M. MANN, New Mexico Agricul tural Experiment Station.) Crown gall is a bacterial disease which attacks such plants as the stone fruits, apples, pears, quinces, walnuts, chestnuts, poplars, willows, grapes raspberries, blackberries, roses, toma tobacco, beets, hope, carnations

The disease is caused by a specific acterium and produces charact galls or knots on the roots of its host. The knot or enlargement is but also occurs on the smaller roots of e instances above the ground.

the growth of the disease continues it

The control of the disease is very difficult, as the removal of the gall does not insure the analication of the trouble from the plant affected. Young trees in the nursery are more susceptible to crown gall than older ones, and for this reason the disease con almost always be detected at the time of transplanting. All diseased

#### en Newspaper Union News Service Prices for Metals. Bar silver .....\$ .86%

WESTERN

MINING AND OIL

**NEWS** 

Copper ...... 23.17 1/2 Lead ..... 6.25 Spelter ..... 7.71 Tungsten concentrates, per unit ......26.00 Boulder.-Tungsten concentrates 60 per cent., \$20.00@22.50 per unit; crude cres, 60 per cent., \$20,00@25.00;

Arizona.

cent., \$9.40@12.50 per unit.

Data hastily gathered indicates that price fixation on silver will directly affect several hundred metal produc ers in Arizona and probably 5,000 workmen.

The Shattuck-Arizona Copper Comdend of twenty-five cents a share and All insect enemies of the gypsy moth twenty-five cents extra, payable Jan. 19. Three months ago the payment

concinnata and two four-winged para- states that following the strike sevsitic flies Apanteles lactelcolor and eral years ago of thirty per cent, ore Anastatus bifasciatus have shown another leaser has broken into an great effectiveness, have withstood our equally rich streak of high-grade cop-

Near Silverton the Highland Mary The chief control measures are cree- is working three shifts at both the soting the egg-clusters, spraying the mine and mill and shipping each

From Silverton comes a report that and thinning the woodland to leave a work is going right along and shipments being made regularly from the Pride of the West mine in Cunningham gulch.

The flotation of minerals dates tells us of the virgins who dipped greasy feathers into the stream and forth gold.

the ore shipments for November were be about 45 degrees, but here again very large, the number of cars of con- the judgment and experience of the centrates shipped totaling 132 as operator must be brought into play. against 116 last year.

has been among the shippers of the position upon the drag. When he ap-Silverton district all year is ready to proaches a high spot in the road he do a considerable amount of develop-ment work during the winter months. The Ariadne property situated on depression he can step toward the Storm peak in the Cement creek section of San Juan county, which is being operated by Alfred B. lies, is rapbeing pushed ahead of the drag. By idly getting into shape to enter the stepping toward the end of the drag shipping list. The Red Mountain shipping season

now drawing to a close proved the three leading shippers of the district to be the Congress Leasing, with 3,000 tons; the Barstow, with 300 tons crude and 250 tons concentrates, and the Summit Mining and Milling Company, with 1,775 tons. Miscellaneous small shipments from the smaller pro ducers in the vicinity bring the total for the district up to between 8,000 and 9,000 tons.

### Montana.

SCHEDULE OF SPRAYS

The two last survivors of the discoverers of gold in Montana met, after a separation of 50 years, at the two last survivors of the discoverers of gold in Montana met, after a separation of 50 years, at the two last survivors of the discoverers of gold in Montana met, after a separation of 50 years, at the two last survivors of the discoverers of gold in Montana met, after a separation of 50 years, at the two last survivors of the discoverers of gold in Montana met, after a separation of 50 years, at the two last survivors of the discoverers of gold in Montana met, after a separation of 50 years, at the separation of 50 years, at the two last survivors of the discoverers of gold in Montana met, after a separation of 50 years, at the separation of state at Gold creek in 1859 and David sults from their spraying must make some changes in the schedule of sprays

Articles of incorporation were filed by the Linda Vista Oil Company, of-

fice at Arthur, N. M. plied when the blossom buds are just beginning to show pink. This spray compiled for the government and for publicity use, the output of the mines compiled for the government and for mixture to which has been added two
pounds of arsenate of lead. This is a
most efficient spray for controlling
mine was the biggest producer, with the Bonney second.

aroung trees are much more serious by injured by the disease than older ones.

The greatest spread of the disease than older takes place in the shipping of infected aursery stock, but the organism causing the disease can be scattered by trigation water or any way that infected soil may be a suppled to the spray should be taken to force the spray into the calyx cup of the apple.

3. The blotch spray should be taken to force that 3,000 tons a day will be reached within the next few weeks. 2. The petal fall spray should be ap-plied when two-thirds of the petals of coal a day. This figure was reached of 1½ gallons of concentrated lime-sul-by the combined output of the princi-

disease can be scattered by water or any way that inbil may be transferred from to another.

This spray should be composed of 3.4.

The blotch spray should be applied to another.

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The deposits are said to be the larger of lead. This is the most effective spray for controlling the applied the spray should be composed of 3.4.

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The deposits on the Gilar river, twenty miles north of Silver City, is being made by Gerald T. Hill of New York.

The deposits are said to be the larger of the deposits are sa est alum deposits on the American continent, and their development would give Grant county still another

The Pioneer Company is reported to have struck a good showing of oil in 36-34-77, Big Muddy, at a depth of 612

several years.

5. The second-brood codling moth spray should be applied eight or ten weeks after the petal fall spray.

The application of a sixth spray may be necessary in order to control a late brood of codling moth. It should be composed of two pounds of arsenate of lead to 50 gallons of water.

The Virginia Oil Company is a new comer which is preparing an active of drilling campaign on the Virginian dome, Emigrant Gap.

Thirty new wells have been finished in Wyoming during the last thirty days, with a production estimated at about 14,000 barrels.

DPERATION OF A ROAD DRAG

Mistake for Operator to Think The Team-Get Best Angle.

Whenever the road drag has been tried and pronounced a failure it is safe to say that it was not used often enough or else it was used at the wrong time or in the wrong way. Some operators seem to think that all they have to do is to drive the team and work, but this is a sad mistake.

In the first place the manner hitching the team to the drag greatly



Operating a Road Drag.

affects its operation. If a short bitch is used the tendency is to raise the front edge of the drag, while a longer hitch makes it cut deeper and move of the team, arrangement of harness, etc., and must be determined by trial.

The amount of skew or angle which the drag makes with the center line of the road also affects the results. back to the accounts of Agricola, who The greater the skew (i. e., the smaller the angle between the drag and the center line of the road) the more earth will be moved toward the cen At Telluride, in San Miguel county, ter. Usually this skew angle should

The driver can control the opera-The Coming Wonder property which fion to a large extent by shifting his can step toward the front, thus making the blade cut deeper, while at a nearest the center of the road he can increase the skew and so move more earth toward the center line, while stepping to the other end of the drag has the opposite effect. In road dragging it is especially true that "prac-tice makes perfect" provided that common sense is used along with the practice.

### **HOW TO PREVENT ROAD DUST**

Breaking Up of Ridges Formed When Roadbed Is Wet From Standing Water Causes Trouble.

James H. Mills, Montana's first news- will run off. The surface will soften York Evening Post Stuart, a member of the party which will not be nearly so bad as when America, the other being the property experience. discovered the first placer gold in the there are ruts which hold the water. of the Indianapolis Speedway, and The wheels of each passing vehicle used to time all the big races B. Weaver, a member of the prospecting party which, in 1864, made the fifth discovery of placer gold, in the Yellowstone valley.

This should be done soon after it The wire which crosses the track is rains. The soil is then soft so it can fastened at one end to an electric be easily scraped off and dropped into break-maker. any depressions. The harrow also The operation is this: Whenever a sys the soil down in layers. It sort car passes over the wire a "break" of plasters it down, which makes a is made in the electric current, and harder surface than when the soil is this causes the timing device to record dumped onto the rondbed. The road the time of crossing. A striking arm drag is the most effective dust preven- imprints the exact time on a strip of ter except oiling the roads.

# TTENTION TO SIDE DITCHES

Privision Should Be Made to Re All Surface Water Rapidly— Guard Against Erosion.

providing side ditches which will remove all surface water rapidly. Side of each as it passes and the official ditches on long, steep grades should time recorded by the machine. The be protected against serious erosion scorers also record these numbers as be protected against serious erosion by riprap, transverse timbers or other beams. Culverts and bridges should be of ample size and be built as permanent structures. Drain tile should be laid to carry of molecular structures. manent structures. Drain tile should be laid to carry off underground water. Side ditches which are kept clean and have sufficient slope to lead the water away are usually preferable to lie drainage, but the latter is necessary in some places.

Agitation in Winter.

Good roads agitation always shows a more rapid pulse during winter, and converts a great number of people who object to traveling over highways in the field of racers. Across from the

who object to traveling over highways that look like an Alpine mountain range. But man has a short and brittle memory. When summer com-the roads lie down flat again enthusiam also lies down and b-the flaps on its coin pecket.

Drag Whenever Per Drag whenever possible seas of the year.

# TIMING AUTO RACE

Passing of Each Car Recorded to Fraction of Second.

## PORTANCE OF SMALL WIRE

Little Strand Is Connected With \$5,000 Timing Device, Which Automat-Ically Records Time of Different Machines.

It is doubtful if in the excitement of watching one of the big automobile races, where human life and small fortunes in prize money are at stake every minute, with the demon cars catapulting around the track to the accompaniment of endless reverberating exhausts spitting forth fire and oke, the layman in the grandstand has any appreciation of the cease less efforts in the press stand, across the track, to furnish him with abso-

event in progress. At intervals throughout the race he is informed as to what cars are leading, the time of the race to that point, the rate of speed, the number of laps,

the progress of the various racers around the track, with an occasional thrilling brush on the back stretch bringing them involuntarily to their feet to cheer some favorite driver, the scorers and timers are tirelessly checking each car as it crosses the little cars seem to run forever. The ownwire stretched across the track, which ers have had them for ten years or marks the completion of a lap. Mission of Small Wire.

erees, timers, scorers, and the drivers look after the lubrication wants in themselves realize the true mission of very much the same way as a caremore material. The correct length of this small wire—which often escapes ful horse owner looks after the wants hitch to use depends upon the height the notice of even those spectators of his fnithful animal. in the grandstand sitting nearest it. If the horse is not fed the proper

a standstill at the pit. They are not allowed to make any mechanical re-pairs or adjustments to the car. These must be made by the driver or his

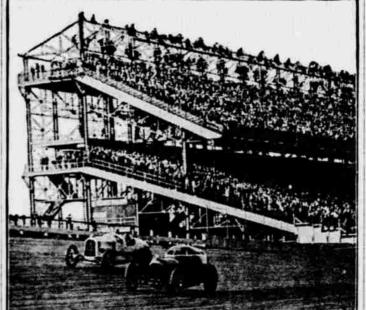
The pit attendants keep a record of the laps made by the car assigned to them and see that the proper tools for emergency uses are at their finger ends when needed. They also see that a reserve supply of tires is available to make any changes that may be neces sary. In case of a tire change the entire wheel is removed and replaced by another wheel with tire already mounted. So expert are some of these pli

men that tire changes are effected by them in twenty seconds. Can Signal to Contestants. Each team of pit men has a system of signals by which they are able to convey to their driver any information desired. They indicate to him the position in the race in order that he may regulate his speed accordingly. After a driver has driven a few laps in a race and has passed another car or has been passed by other cars and ecomes bunched with several other drivers—a common experience—he often loses track of his position among accurate detailed records of the the drivers. Here is where the signaling from his pit is invaluable to him. Racing drivers have been known to win important races unknowingly, having lost count of their position in the race.

#### While the crowd is busy following LUBRICATION WANTS OF CAR

Unless Looked After Carefully Automobile Will Not Run in a Comfortable Spirit.

You may have noticed that some more, and like them so much that they will not part with them. It is Only the official starter, judges, ref- because they take care of them and



RACERS TAKING SOUTH TURN AT SHEEPSHEAD BAY.

Few know that in races sanctioned by | foods and given the proper attention the American Automobile association at all times he will not be able to Dust in the road is largely caused nected with a \$5,000 timing device,

The automobile is the same in that

paper which passes through the ma-chine. This paper is automatically shifted forward to receive the next im-pression. The machine recovers from each operation quickly enough to permit the registration of two cars pass ing over the wire within five hun dredths of a second of each other.

Tell Exact Number of Laps. An assistant calls out the number

in the field of racers. Across from the

grandstand is a series of compar ments, each fronting on the track,

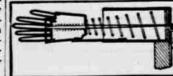
Young Trees Are More Suscepti- Plan That Should Meet Condiwalls, grunts and squeaks that will feet recently and resigned." Cold feet! paper publisher. They were Granville up some in case of a long rain, but it There are but two such devices in make your motoring an unpleasant

held SIGNAL FOR AN AUTOMOBILE

Washington Invents Device to Repre sent Human Hand, Operated From

The Scientific American in illustrating and describing an automobile signal, invented by E. P. Goochild of Spoknne. Wash., says:

The principal object of the invention is to provide an automobile signal



formed to represent a human hand, which is so constructed that it may be operated from the inside of a closed car for signaling an intention to stop or turn, to approaching vehicles, the device may be actuated quickly by a spiral spring whose tendency is to force the hand outwardly, whereby to tend position, this may be accompled without necessitating the open moving from his driving position.

TO MEND LEAKY WINDSHIELD

le May Be Averted by Over-

ments, each fronting on the track, commonly known as pits.

Each contestant is entitled to have five attendants, including the team manager, in the pit assigned to his car. But only two attendants are permitted to make replacement of gasoutered. This trouble may be obvisted by making one of the panes overlap the other, which, of course, calls for the fitting of a new upper or



Do Your Cows Fail to Clean? Cow Cleaner Prisa



W. N. U., DENVER, NO. 52-1917.

Strange War Craft.

Plans for one of the strangest war vessels ever proposed have been submitted to the council of national defense, says Popular Mechanics Magazine. The craft is an enormous oceangoing water wheel that is intended to perform much the same service for the navy as the British and French tanks have for the allied armies. Although highly visionary and entirely untried, it has novelty and potential power that draws attention. In addition to being amphibious to a certain degree, it is theoretically capable of great speed. Essentially it consists of two big connected cylinders that are supplied around their outer rims with adjust-able paddles. The horizontal axle offers space for a crew and is gyro-scopically stabilized to support a fightng mast. Opposite ends of the axis are utilized as gun turrets.

The Opinine That Does Not Effect Head Bromo Quinine can be taken by anyone without in only one "Bromo Quinine." Is well only one in only one "Bromo Quinine. Is W. GROVEN signature so now. X.

A Berlin Advertisement.

In Germany now there are advertise-ments which are not only news, but imply a great deal outside of the direct news sought to be conveyed.

As an instance the Berlin Tages Zeitung recently contained a want ad, reading as follows: "For exchange, 50 Polish laborers, 20 men and 30 girls, for the same number of other hands."
Polish laborers in Germany are not permitted to change masters or to nove from place to place without govmment authorization. With such authorization, however, the masters can ike exchanges, as we trade horses and mules, or as our housewives exchange soap grease for soap, or old rags for door mats, kitchen tins and

### BOSCHEE'S GERMAN SYRUP

Why use ordinary cough remedies, when Boschee's German Syrup has een used so successfully for fifty-one rears in all parts of the United states for coughs, bronchitis, colds settled in the throat, especially lung roubles. It gives the patient a good night's rest, free from coughing, with easy expectoration in the morning. gives nature a chance to soothe the inflamed parts, throw off the disease, helping the patient to regain his health. Sold in all civilized countries. 30 and 90 cent bottles .- Adv.

something charmingly homelike to Americans in at least one passage of a recent alleged interview between a newspaper correspondent What is Russian for cold feet?-Chris

tlan Science Monitor.

An Ultimatum. "Henry, we must raise the salary of

our house girl." "Why, she's the worst we've ever

"That doesn't make any differen The Glithersbys next door pay their girl 50 cents a week more than we pay ours, and I'm not going to have my so cial standing in this com pardized for a paltry half dollar.

Red Cross Bag Blue, much better, goes farther than liquid blue. Get from any grocer. Adv.

Some Pictures. Bill-You know motion picture films showing the entire process of honey-making by bees have been made by a United States government expert, Jill-Is that right?

"Sure, and they are said to be so lifelike that the day after they were first produced an epidemic of hives

broke out among the population." In Sporting Terms. Friend-Why did you bring back that regiment of boxers you took

to fight? all right, but they wanted to name put up a side bet of \$10,000,000 and stage the fight in New York or Mil-

